

BIBLICAL CREATION

JOURNAL OF THE BIBLICAL CREATION SOCIETY

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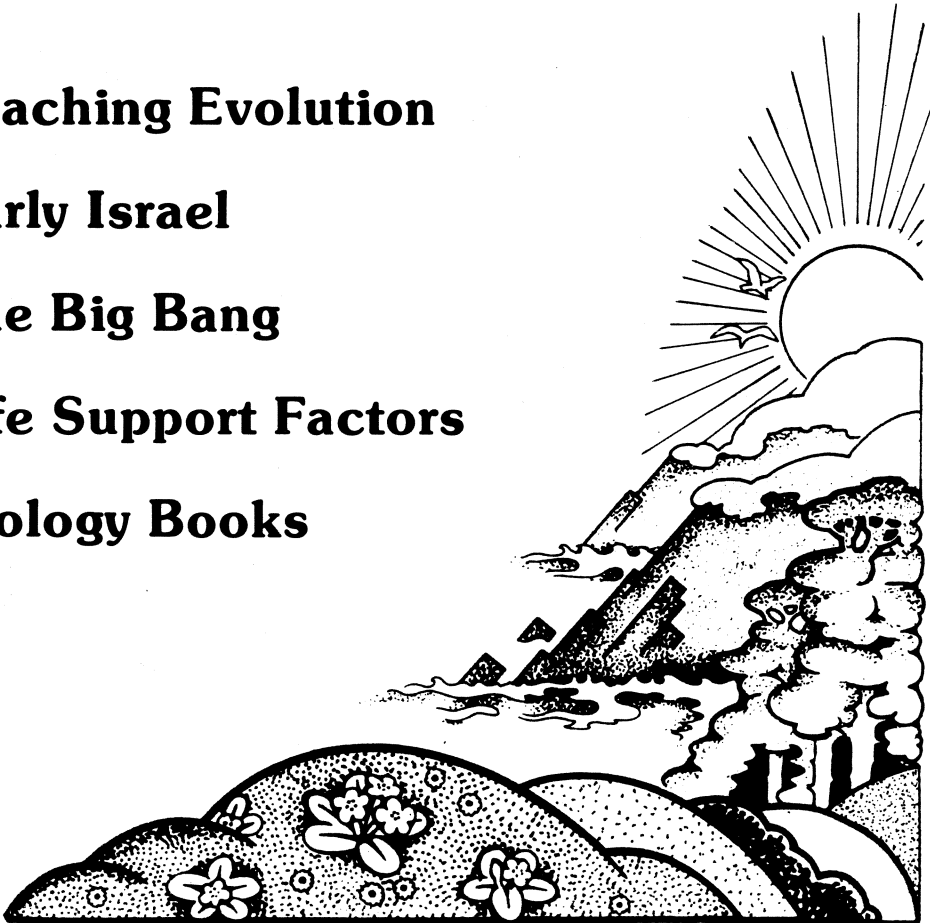
Teaching Evolution

Early Israel

The Big Bang

Life Support Factors

Biology Books



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EDITORIAL

The Transatlantic Connection

Creationists in Britain are indebted to their opposite numbers in the U.S.A. For many years now the leading figures of the American creationists scene have been household names among British evangelicals. Whether respected or reviled their influence has been incalculable.

In recent years a number of these men visited our shores. And it is with pleasure that we hear of the forthcoming lecture tour by Dr. Duane Gish of San Deigo, California. However, we would not be true to our evangelical heritage if we allowed these men to do all our intellectual spadework for us. Moreover, there is a current problem, not merely a hypothetical danger, that our views are simply equated at every point with those of American creationism. In the Open University course: Science and Belief: from Darwin to Einstein (block vii, Unit 15 p. 54) Dr. James Moore observes the rise of the Biblical Creation Society in Britain and too readily indentifies our political stance as right wing, if not neo-fascist! Perhaps the political views of British Creationists would provide someone material for a Ph.D. in Sociology (if the Social Sciences Research Council is spared the axe!). Meanwhile we emphasise that in our experience there is substantial diversity of political preference among our constituency.

The concerns which motivate us are far more basic and radical than the issues of party politics. As we recoil from this misrepresentation we sympathise with Dr. Halstead's desire to clarify his position in our correspondence section.

A further problem is highlighted by the recent legal case in Arkansas over the teaching of 'scientific creationism' in public schools. The distinction between 'scientific' and 'Biblical' creationism is largely a device to circumvent a particular legal interpretation of the U.S. Constitution which forbids religious instruction in these establishments. There are some merits in this distinction which may be the subject of subsequent discussion in this Journal. Nevertheless, we have profound reservations about the concept of a would-be autonomous 'scientific creationism' which disavows its connection with God's revelation in the Scriptures.

We do not pass judgement upon the strategy adopted by our American colleagues in their cultural setting. But for our part we cheerfully acknowledge the positive Biblical basis for our position. This undergirds our philosophical and objective scientific critique of evolutionary naturalism. Consequently our scientific endeavours are sustained by confidence in God, not vice versa. Hence the name of this journal and of our society. And hence our divergence from, as well as our unity with, many of our friends in America.

David Watts

CONTRIBUTORS TO THIS ISSUE

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NEWS ITEMS

Visit of Dr. Duane Gish to Britain

After a successful tour of Centres and Universities in the Autumn of 1979, under the auspices, at that time, of Campus Crusade for Christ, Dr. Duane T. Gish of The Institute for Creation Research, is to spend another two weeks from May 10th to May 23rd, 1982, touring and lecturing in this Country. This time under the auspices of Mr. John Cunningham of the Withycombe Barton Christian Field Study Centre, Exmouth, Devon. This centre is to be formally opened by Dr. Gish on Friday May 21st, 1982.

Dr. Gish is well known and well appreciated for his spirited and skilful argument in favour of the teaching of Creation as an alternative to Evolution, at all levels of our Education Systems. He also points out the philosophical and sociological implications that the teaching of Evolution has on Society. He is well qualified to do this from a scientific point of view as well as a Biblical one, as for many years he has successfully lectured and debated the subject, not only in the United States of America, but in many other countries around the world. He recently appeared on a BBC2 Horizon programme about Evolution and Creation and so his tour in Great Britain will give us the opportunity to hear this man and judge for ourselves the strength or weakness of his case.

Lectures and debates are to be arranged in London, Oxford, Cambridge, Birmingham, Manchester, Glasgow, Cardiff, Exeter and Bristol. It is also hoped that Dr. Gish will appear on television and will be heard on national and local radio.

The details of this itinerary are being arranged by David Rivers of 5, Gallowfields Road, Richmond, North Yorkshire DL10 4DB, telephone 0748 3138, who has also opened an account to cover the costs of this itinerary, the air fare already being underwritten! He values your interest and support both at the meetings and in prayer and publicity, together with any gifts or offerings which should be made payable to, "Dr. Gish, itinerary account".

David Rivers

Correction

In the previous issue of the Journal, reference was made in Mr Lawrence's book review to Pharaoh Tuthmosis III. This was correctly printed on p. 94 but incorrectly printed on p. 93 as Tuthmosis II.

CORRESPONDENCE

DEPARTMENT OF GEOLOGY
University of Reading

Dear Dr. Watts,

Science and Politics

I was interested to read the recent article by David J. Tyler 'Establishment Science and the British Museum' which in general I felt to be a perceptive summary of the current controversy surrounding the British Museum (Natural History). Naturally I would not expect to receive any support in my defence of Darwinism in the columns of your journal, but, allowing for the basic difference in attitudes of the author, I found his presentation of my stand as fair as could reasonably be expected. There was unfortunately one lapse to which I do take grave exception. David Tyler claims that my "political thinking is linked in some way to (my) scientific thinking", he goes on "we are entitled to ask: how far do his (Halstead's) political views influence his scientific views?" The inference is that as I appear to hold to a "gradualist reformist" approach politically, then it is this that colours my scientific views and that I simply have some kind of political axe to grind.

For the record since I have been asked albeit in a rhetorical question, I would like to state categorically that my gradualist view of evolution is based on my own personal research on fossil vertebrates, together with my assessment of the results of fellow workers in this field. I would emphasise this because at the time my main research began, my political views were much in sympathy with a revolutionary interpretation of human society and politics. It was the science that led me away from revolutionary politics and towards the "gradualist reformist" approach, not the other way around.

Yours sincerely,

L.B. Halstead, D.Sc.
Reader in Geology and Zoology

THE TEACHING OF EVOLUTION AND CREATION

J.H. John Peet

Problems for parents and teachers.

There is an increasing concern in our churches about the content of school courses, not least in the area of evolution. Some three or four years ago, a teacher was sacked, apparently, for teaching that evolution was wrong. Can we—as parents and teachers—do anything to counter these trends?

Our aim in this paper is not to argue the case for or against evolution. We are working on the basic premise that evolution, in the commonly used sense of the word, is scientifically and scripturally false. What, then, can we do when the school and home (or church) teaching conflict?

What is the nature of the problem?

The theory of evolution is basically the belief that there has been a gradual development from non-living to simple living to more complex living systems. Usually this is believed to have occurred by means of small genetic changes, but some (because of the problems of this approach) have suggested that there might have been larger jumps (known technically as ‘punctuated equilibrium’ or, more commonly, as ‘hopeful monsters’).

Weisz states that “no biologist today seriously questions the principle that species arise from pre-existing species.”¹ But this is clearly not true. One school textbook is a little more honest in its attitude: “... it must be emphasised that it is indeed a theory and not an established fact. Although it is widely regarded as an acceptable hypothesis to account in general terms for the existence of the living organisms we know today, much of the evidence for the theory is either very incomplete or circumstantial.”² G.H. Harper, in a series of articles in the “School Science Review” has spoken out against the false assumption of the validity of Darwinism and the subsequent indoctrination of children—and he is not a creationist.³

Obviously this problem affects biology teaching, but it also affects other areas of education. A few examples will suffice.

a) Geology—nearly two centuries ago the formation of rocks and fossils was believed to have occurred by aquatic deposition. This concept was rejected for political and anti-religious reasons. The classical geological column is set up as an evolutionary model for the physical history of the world. Neither its limitations nor any other mechanism is considered. A lot of publicity has been given to the presence of contemporaneous dinosaur and human footprints in the Paluxy River⁴ and yet some teachers actually deny these facts rather than face them and their implications.

b) History—prehistory is often governed by the assumption that man was sub-

standard (in comparison to modern civilisation) and so his history is distorted. For a counter-balancing view, read the work of D. Tyler on neolithic man in Europe; his studies show him to have been advanced in his knowledge of geometry, astronomy, technology and to have had an advanced culture.⁵

c) Theology—the 'R.E.' lesson is often governed by similar principles: religion has evolved, for example, from polytheism to monotheism. The records of Genesis are too advanced to predate the polygod myths of Babylon and so must be a later work. So, of course, modern religious concepts are evolving until we can replace YHWH with our own mental idols.

(d) Medicine—though not normally a part of the school curriculum, it may be considered in general/liberal studies. We are evolving—only the better/best can be allowed to survive; we must eliminate the 'cabbage' (which has no soul, it is only an animal)—here is a profound difference in attitude between the creationist and the evolutionist! So, we have abortion, infanticide and euthanasia encouraged.⁶

e) Ethics—according to Huxley, "cunning and ruthlessness" is the law of the jungle and has "to be the directive for all so-called human progress." So, I'll get to the top, to the front of the queue, or whatever, regardless of men or means. Sex education in schools is also devoid of morality.

f) Literature⁷—the most subtle area, in which the set books often display the non-accountability of man, amoral principles and the "might is right" attitude.

g) Music—the modern person has "grown up" and outgrown the old restraints developed from the Scriptures. This has affected the arts, including the music. The movements such as "punk" are a rebellion against authority, morals, etc.

h) Social sciences—the very basis of modern society is strongly influenced by evolutionary principles.⁸ Every modern political framework is based on these same tenets: socialism of Marx (class struggle is predominant); racialism of Hitler (race struggle is predominant); capitalism of Sumner (economic struggle is predominant)—all else (e.g. morals) are subservient to the dominant motive.

Spencer Leeson has observed that knowledge, power and happiness are becoming an end in themselves: so everyone has a right to set up their own goals; there are no absolutes, there is no authority; the child is responsible only to himself.⁹ As Francis Schaeffer has put it, "In his own naturalistic theories . . . man has lost his unique identity."¹⁰ These are the principles—directly or indirectly—that guide the modern, progressive (?) education.

How do we deal with it?

(a) *As teachers.*

The dismissal of a teacher for teaching creation rather than evolution became a point of anxiety for creationists. But many teachers have discussed and

debated evolution without a conflict of this type with the authorities, and such a conflict is not necessary. So how do we approach the situation?

Firstly we must recognise the nature of the education. Johnstone has said that “Teaching is . . . a series of diminishing deceptions.”¹¹ To many, education is simply the imparting of knowledge. It is that (especially at the younger age level), but only in part. We should seek to encourage an understanding—but the child’s mental development must be taken into account. Hence Johnstone’s point: our teaching gradually refines earlier ideas in order to give the students a fuller, and, hopefully, a truer picture. Ultimately we are concerned with wisdom, but “the reverence and fear of God are basic to all wisdom. Knowing God results in every kind of understanding.”¹² So, we must recognise our constraints, but strive to develop those common graces that God has given to all men—and children.

So in our present context we must teach the *facts* at the lower age range: there are many classes of animals; that they can be classified into particular categories (families, species, etc.) depending on certain characteristics. We can also explain the scientist’s problems when attempting to classify living species.¹³ There are similarities and differences within these groups. So we can draw attention quite naturally to the differences between man and other primates.

We can talk about the formation of coal and oil and the conditions needed to form them—and how it can be done in a laboratory (long times are *not* necessary). We can describe fossil formation and the requirements for it and how they could be met (drawing a contrast to the normal decay processes). We can talk about rock layers and how they are formed today. We can refer to the tree trunks that cross vertically through many feet of a coal seam, showing that the coal must have been deposited rapidly.¹⁴ We can refer to the extensive burials of multitudes of animals (e.g. the Siberian mammoths), drawing attention to the fact that these required instantaneous burial. We can talk about the footprints—dinosaurs with men; men with trilobites in their prints. We can discuss the ‘miracles’ of nature—the woodpecker that does not “bash its brains out,”¹⁵ the bombardier beetle that does not blow itself to bits,¹⁶ we can talk about the symbiotic relationships in nature: plants and animals that have a close interdependence in order to survive and so, to exist.

No one can dispute these facts—and they lay a foundation that will be a good preparation for the future: and they will not need to be untaught. Certainly, there is a lack of good literature around along these lines—we need to encourage some to write and produce them.¹⁷ The potential market is good. The *type* of production to consider is the Lion Publisher’s book, “Wonders of Creation.” Even though it is non-committal on evolution, it is appropriate for school use and attractively presented.

Science, only, has been mentioned but this is because it is the centre of the trouble, especially at this level. The same principles can be developed elsewhere.

At a more advanced level in schools, we have to look at the facts and discuss how scientists explain them. We *must*, therefore, teach the *theory* of evolution, but we are entitled to point out its weaknesses too and also that many believe in creation. Here, a mention of a list of creationists in the biological or other sciences would not be inappropriate. A few quotes from experts would also be timely. The American “two-model approach” is, in principle at least, right, but we do not accept their concept of ‘scientific creationsim.’ However, certain points must be underlined:

- (a) identify carefully the facts (or ‘data’);
- (b) understand and explain clearly how a theory is developed;
- (c) describe the limitations of science;
- (d) give a fair analysis of both approaches (in this context, of both evolution and creation);
- (e) recognise that this is a principle that we must *always* follow if we are to be honest. We must be consistent—not just in this subject, but in our teaching of science as a whole, otherwise we cannot defend our right to a two-model approach on origins. If the students (and our colleagues) see us commenting critically on *all* theories, then they will be ready to listen to us on this one. And we will have been laying our foundations for this particular issue over the years.

Teachers of other subjects can be supportive by applying the same critical approaches. Sometimes their value is especially appropriate—for example, the geologist can produce the evidence that disproves the basic postulate that terrestrial evolution began in a reducing atmosphere,¹⁸ and chemists can show—using only the tools of ‘A’ level chemistry—the impossibility of the critical stages of chemical evolution.¹⁹

(b) As parents.

First of all, we must recognise that the teaching of our children is OUR responsibility. Children do not belong to the state (as in the communist system), nor to the church (as in Romanism), nor to the parents (as commonly assumed in our country), nor even to themselves—but to God, by right as Creator. He, or she, is responsible to God and *we* must teach him, or her, to recognise that claim. Education involves the whole man and all aspects of education should direct the child to God. While we may require assistance in some specialised areas (for example, in subjects in the school curriculum or in teaching doctrine), we cannot abdicate our responsibility. We must know what is being taught and be prepared to correct it (using more experts, if necessary!).

How can we fulfil this commission? First of all, we must remember the importance of early, positive foundations. A respect for God's Word, and an interest in the facts of nature will reap their own rewards. When teachers contradict our teaching and so confuse the youngsters, then we must explain their spiritual blindness. But—do not be disrespectful of the opposition. They are, normally, sincere scientists (or teachers of science). Mockery is wrong and can often backfire on us. I believe too that our churches should have a supportive role here: arranging talks, having libraries of suitable books, carrying articles in church magazines, etc.

Then in our relationships with the schools, do not be seen as trouble-makers: you will merely cause entrenchment. Often well-meaning evangelicals only interact with the school when they want to complain (or claim a right to send 'their man' into the R.E. lessons, etc.). Again, it is important to build up relationships by participation (e.g. through the parent-teachers associations), being seen as helpers and supporters. Our contributions in the field of evolutionary controversy may then be seen in the light of this helpfulness. We can donate books (*good* books) to the school library. This has always been a welcome move, but especially so in the current financial climate. Support, too, the Christian teachers on the staff.

Conclusion.

Finally, we must be informed. Read literature and get magazines yourself. Have them available in the home for the children to consult. All these things require effort—whether we are teachers or parents—but the enemy has put a lot of effort into false teaching as we have a lot of ground to catch up on. We owe our children the truth.

References.

1. P.B. Weisz, *Elements of Biology*, McGraw-Hill, 1969, p. 434.
2. J. Macqueen, *Success in Biology*, Murray, 1976, p. 439.
3. G.H. Harper, *School Science Review*, 1977, 59 (207), 258.
4. Film: "Footprints in the Stone" (available through Light and Life Films, Edinburgh);
B. Newton, *Monsters and Men*, Dunstone Printers Ltd., 1979, chap.9.
5. D.J. Tyler, *Creation Research Society Quarterly*, 1979, 16 (1), 47;
idem, ibid, 1980, 17 (1), 3.
6. F.A. Schaeffer & C.E. Koop, *Whatever Happened to the Human Race*, Marshall, Morgan & Scott, 1979.
7. J.N. Moore, *ICR Impact Series*, 1977, no. 53.
8. P.D. Ackerman, *Creation Social Science and Humanities Quarterly*, 1979, 1 (4), 24;
J.N. Moore, *ICR Impact Series*, 1977, no. 52.

9. S. Leeson, *Christian Education*, Longmans, Green & co., 1947, p. 110.
10. F.A. Schaeffer, *Genesis in Time and Space*, Hodder, 1972.
11. A.H. Johnstone, *Chemistry in Britain*, 1980.
12. Proverbs 9:10 (Living Bible paraphrase).
13. *Origin of Species*, British Museum—Cambridge University Press, 1981, pp. 25-33.
14. E.H. Andrews, *From Nothing to Nature*, Evangelical Press, 1978, p. 62 and plate 6.
15. L.D. Sutherland, *Creation Research Society Quarterly*, 1976, 12 (4), 183.
16. H. Schildknecht & K. Kolobek, *Angewandte Chemie*, 1961, 73 (1), 1.
17. The Biblical Creation Society has initial plans under way for both 'popular' and scientific monographs (*Biblical Creation*, 1981, 3 (9), 32), but the author has in mind publications for children.
18. E. Dimroth & M.M. Kimberley, *Canadian Journal of Earth Sciences*, 1976, 13, 1161;
C.F. Davidson, *Proceedings of the National Academy of Science*, 1965, 53, 1194.
19. (e.g.) D.E. Hull, *Nature*, 1960, 186, 693.

THE EARLY HISTORY OF ISRAEL AND ITS NEIGHBOURS

A Classified Bibliography

by John J. Bimson

Introduction

Students of the Old Testament have always been interested in the historical passages, particularly those which record Israel's involvement with other nations. The sojourn in Egypt, the Exodus and the settlement of Canaan are notable instances of international activity. It is not difficult to discover that much of the so-called 'Higher Criticism' of the Old Testament is committed to the acceptance of numerous discrepancies between Biblical history and the conclusions of archaeological investigations. The aim of this literature survey is to assist Christians who wish to make this area of apologetics their own.

Some additional discussion of the chronological aspects of this survey is warranted. The Biblical history of earth's origins, from creation to Babel, is incompatible with evolutionary history. A creationist apologetic, therefore, is required. The early history of Israel and the nations is transitional between the controversial pre-civilisation period and the largely non-controversial chronology of the later civilisations. It is the judgment of a number of creationists that many of the difficulties in reconciling Biblical and archaeological data in this transitional period are a result of serious errors in the chronology of the ancient world, and of Dynastic Egypt in particular. The differing views of Biblical scholars are reflected in this literature survey.

A major revision of the chronology of ancient civilisations must lead to fundamental changes in thinking about the rise of civilisation, the significance of neolithic man and also the interpretation of palaeolithic man. It is hoped therefore that Dr. Bimson's survey will not only be useful to students of Old Testament history and ancient civilisations, but also to prehistorians and others with related interests.

The journals *Kronos* and *SIS Review* may not be familiar to readers of the Bibliography, For further information, see BC 9, p 52.

David J. Tyler

I. Ancient Near Eastern Background

Cambridge Ancient History, 3rd edn., vol II, pt. 1, 1880-1380 BC, C.U.P. 1973, vol II, pt. 2, 1380-1000 BC, C.U.P., 1975.

J. Bright, *A History of Israel*, 3rd edn., S.C.M., London 1980, ch. 1, "The World of Israel's Origins" (the ancient orient, c. 2000-1750 BC); ch. 3, pt. A, "Western Asia in the Late Bronze Age" (the Egyptian empire in the XVIII & XIXth Dynasties).

R. De Vaux, *The Early History of Israel*, trans. D. Smith, Westminster Press, Philadelphia, 1978, chs. 3-16 (ancient near east c. 2000-1200 BC), pp. 55-522.

H.R.H. Hall, *The Ancient History of the Near East*, 10th edn., Methuen, London, 1947 (somewhat out of date, but still the most comprehensive history of the ancient near east in a single volume).

W.W. Hallo and W.K. Simpson, *The Ancient Near East: A History*, Janovich, N.Y., 1971: Pt I, "Mesopotamia and the Asiatic Near East" (pp. 1-183); Pt II, "Egypt" (pp. 187-302).

K.A. Kitchen, *The Bible in its World*, Paternoster, Exeter, 1977 (The most up-to-date brief survey of archaeology and ancient near eastern background to the earlier parts of Old Testament history—i.e. pre-monarchy—and most reliable summary in English of the Elba material).

S. Moscati, *The Face of the Ancient Orient*, Routledge and Kegan Paul, London, 1960: useful discussions of the Sumerians, Babylonians and Assyrians, Egyptians, Hittites and Hurrians, Canaanites and Aramaeans, Israel, Persians.

S. Moscati, *Ancient Semitic Civilisations*, Elek Books, London, 1957: slightly briefer than the above; discussions of Babylonians and Assyrians, Canaanites, Hebrews, Aramaeans, Arabs and Ethiopians.

D.J. Wiseman (ed.), *Peoples of Old Testament Times*, Clarendon, Oxford, 1973; most relevant to biblical background are:

- ch. 1 "The Hebrews", H. Cazelles (pp. 1-28)
- ch. 2 "The Canaanites", A.R. Millard (pp. 29-52)
- ch. 3 "The Philistines", K.A. Kitchen (pp. 53-78)
- ch. 7 "The Assyrians", H.W.F. Saggs (pp. 156-178)
- ch. 8 "The Babylonians and Chaldaeans", W.G. Lambert (pp. 179-196)
- ch. 9 "The Hittites and Hurrians", H.A. Hoffner (pp. 197-228)
- ch. 11 "The Phoenicians", D.R. Ap-Thomas (pp. 259-286)

II. Egypt: History and Chronology:

a) History

J.H. Breasted, *A History of Egypt*, Hodder & Stoughton, London, 1906. From the earliest times to the Persian conquest (525 BC). Largely out of date, but still useful.

J.H. Breasted, *Ancient Records of Egypt*, 4 vols (vol 5 = indices), Chicago U.P., 1906. Translations of Egyptian documents; again, outdated but useful, and has never been replaced by a work of similar scope.

E. Drioton & J. Vandier, *L'Égypte*, Paris, 1962. A very comprehensive treatment, in French, of Egypt's history, culture and religion, from prehistoric times to Alexander (700 pp.).

A.H. Gardiner, *Egypt of the Pharaohs*, O.U.P., London, 1961. From the prehistoric period to Alexander's conquest (332 BC). More up-to-date (and more cautious where evidence is uncertain) than Breasted.

W.W. Hallo and W.K. Simpson, as in I above, Pt. II, "Egypt", pp. 187-302.

K.A. Kitchen, *The Third Intermediate Period in Egypt*, Aris and Phillips, Warminster, 1972. Covers the period c. 1100-650 BC, i.e. the time of Egyptian contacts with the Hebrew monarchies.

M.A. Murray, *The Splendour that was Egypt*, Sidgwick & Jackson, London, 1949.

A. Rosalie David, *The Egyptian Kingdoms*, Elsevier: Phaidon, Oxford, 1975. A lavishly illustrated and accurate introduction to Egyptian history and culture.

J. Ruffle, *Heritage of the Pharaohs*, Phaidon, Oxford, 1977. An accurate and up-to-date introduction to Egyptian archaeology.

J.A. Wilson, *The Burden of Egypt*, Chicago U.P., 1951.

b) Egyptian chronology

A.H. Gardiner (as in IIa), ch. IV (pp. 46-71): brief summary of Sothic dating method, with useful discussion of the sources for reconstructing Egyptian history.

R.A. Parker, *The Calendars of Ancient Egypt*, Chicago U.P., 1950.

R.A. Parker, "The Calendars and Chronology", in J.R. Harris (ed.), *The Legacy of Egypt*, 2nd edn., 1971, pp. 13-26.

The following works are critical of the Sothic dating method:

D.A. Courville, *The Exodus Problem and its Ramifications* (2 vols), Challenge Books, Loma Linda, 1971, vol. II, ch. IV (pp. 48-89): a very thorough critique of accepted views.

J. Dayton, *Minerals, Metals, Glazing and Man*, Harrap, London, 1978, p. 190, criticises the Sothic date from the reign of Sesostriis III. (But Dayton's own alternative chronology is invalid).

R.D. Long, "A Re-examination of the Sothic Chronology of Egypt", *Orientalia* XLIII, 1974, pp. 261-274; reprinted in *KRONOS* 1:4, 1976, pp. 9-23. This paper has since been criticised in a reply by R.A. Parker, "The Sothic Dating of the Twelfth and Eighteenth Dynasties", in *Studies in Honor of George R. Hughes* (Studies in Ancient Oriental Civilisation, no. 39), Chicago, 1977 (pp. 177-189). Reprinted in *KRONOS* VI:1, 1980, 53-66.

J. Mellaart, "Egyptian and Near Eastern Chronology: A Dilemma?" *Antiquity* 53, 1979, pp. 6-18; but NB Mellaart (like Dayton, above) only criticises Middle Kingdom Sothic dates, and does this to support a *higher* chronology of his own, based on radiocarbon dates.

I. Velikovsky, "Astronomy and Chronology", *Pensée* III : 2, 1973, pp. 38-49; reprinted in *Peoples of the Sea*, Sidgwick & Jackson, London, 1977, pp. 203-244. A thorough examination of false presuppositions of the conventional dating method, but part of the discussion incorporates Velikovsky's own unacceptable dating of the XXth Dynasty.

III. The Date of the Exodus and Conquest

a) Studies adopting the conventional chronology of Egypt and the Ancient Near East.

i. Works which present the late date (13th century BC)

This date is almost universally followed at present. The following are only a representative selection of works which adopt it or argue for it.

R. De Vaux (as in I above), chs. 11-13 (pp. 388-392).

R.K. Harrison, *A History of Old Testament Times*, London, 1957, chs. III & IV (pp. 77-118).

R.K. Harrison, *Introduction to the Old Testament*, Tyndale Press, London, 1970, pp. 174-177 and 315-325, discusses evidence for both early and late dates, though favouring the latter.

K.A. Kitchen, *Ancient Orient and Old Testament*, Tyndale Press, London, 1966, ch.3, pt. I (pp. 57-75).

K.A. Kitchen, *The Bible in its World* (as in I above)

K.A. Kitchen, & T.C. Mitchell in J.D. Douglas, N. Hillyer et al. (eds.), *The Illustrated Bible Dictionary* (3 vols), IVP, Leicester, 1980, vol. I, pp. 268-277.

K.M. Kenyon, *The Bible and Recent Archaeology*, Brit. Mus. Publications, London, 1978, pp. 25-43 (a very liberal treatment of the biblical narratives).

H.H. Rowley, *From Joseph to Joshua*, London, 1950. A useful discussion of various views put forward up to that time.

E. Yamauchi, *The Stones and the Scriptures*, IVP, London, 1973, pp. 41-57.

ii. *Works which present the early date (15th century BC)*

J.J. Bimson, *Redating the Exodus and Conquest*, JSOT, Sheffield, 1978; 2nd edition, Almond Press, Sheffield, 1981.

J.J. Bimson, "Archaeological data and the dating of the Patriarchs", in A.R. Millard & D.J. Wiseman (eds), *Essays on the Patriarchal Narratives*, IVP, Leicester, 1980, pp. 59-92, esp. pp. 81ff.

J.J. Davis, "*Moses and the gods of Egypt*" Baker Book House, Grand Rapids 1971. Chapter I, *Conquest and Crisis*, Baker Book House, Grand Rapids, 1969, chapter I.

J. Rea, "The Time of the Oppression and the Exodus", *Bull. of the Evangelical Theological Society* 3, 1960, pp. 58-69.

J. Rea, "New Light on the Wilderness Journey and the Conquest", *Grace Journal* II : 2, 1961, pp. 5-13.

B.K. Waltke, "Palestinian Artifactual Evidence Supporting the Early Date for the Exodus", *Bibliotheca Sacra*, 129, 1972, pp. 33-47 (see the discussion of this paper in Bimson 1978, pp. 122-127, 189-191).

L. Wood, "The Date of the Exodus", in J. Barton Payne (ed.), *New Perspectives on the Old Testament*, Waco, Texas, 1970, pp. 67-86 (see the discussion of this paper in Bimson 1978, pp. 122-127, 189-191).

L. Wood, *A Survey of Israel's History*, Pickering & Inglis, London, 1970, chs. 5-8 (pp. 83-202).

b) Studies adopting a revised chronology for Egypt and related Ancient Near Eastern cultures.

Courville (as above in II(b)).

Velikovsky, *Ages in Chaos*, Sidgwick & Jackson, London, 1952. (The pioneering study in revising the chronology of Egypt in relation to biblical history. This volume deals with the background to biblical history from the Exodus to the late 9th century BC).

J.J. Bimson, "The Conquest of Canaan and the Revised Chronology", *SISR* I : 3, 1976, pp. 2-7.

J. J. Bimson, "A Further Note on Jericho", *SISR* I : 5, 1977, p. 16.

J.J. Bimson, "A Chart on the Conquest of Canaan", *SISR* II : 3, 1977-78, pp. 57-58.

J.J. Bimson, "The Hyksos and the Archaeology of Palestine", *SISR* III : 2, 1977-78, pp. 58-64.

J.J. Bimson, "A Chronology for the Middle Kingdom and Israel's Egyptian Bondage. I: The Time of Joseph", *SISR* III : 3, 1978-79, pp. 64-69; "II: Israel in Egypt", *SISR* IV : 1, 1979, pp. 11-18.

All the above, adopt the early (i.e. 15th century BC, biblical) date for the Exodus.

IV. Additional Discussion of Chronological Revision

J.J. Bimson, "Dating the Wars of Seti I" *SISR* V : 1, 1980/81, 13-27.

J.J. Bimson, "An Eighth-century Date for Merenptah", *SISR* III : 2, 1978, pp. 57-59.

A.W. Burgstahler, "The El-Amarna Letters and the Ancient Records of Assyria and Babylonia", *Pensée* 3:3, 1973, pp. 13-15 (points out some obstacles to Velikovsky's date for the XVIIIth Dynasty.)

J. Day, J.J. Bimson and P.J. James, "A Colloquium: An 8th-century date for Merenptah", *SISR* IV : 2/3, 1979-80, pp. 58-62.

E. Danelius, "The Identification of the Biblical 'Queen of Sheba' with Hatshepsut, 'Queen of Egypt and Ethiopia'", Pt I, *KRONOS* 1:3, 1975, pp. 3-19; Pt. II, *KRONOS* 1:4, 1976, pp. 9-23.

E. Danelius, "Did Thutmose III Despoil the Temple in Jerusalem?", *SISR* II : 3, 1977-78, pp. 64-79.

G. Gammon, "The Place of Horemheb in Egyptian History", *SISR* III : 2, 1978, pp. 55-57.

G. Gammon, "A Chronology for the XVIIIth Dynasty", *SISR* II : 3, 1977-78, pp. 90-94.

L.M. Greenberg *et al.* "Special Supplement on Sothic Dating", *KRONOS* VI:1, 1980, 51-85.

I. Isaacson, "Carbon 14 Dates and Velikovsky's Revision of Ancient History: Samples from Pylos and Gordion", *Pensée* 3:2, 1973, pp. 26-32.

I. Isaacson, "Applying the Revised Chronology", *Pensée* 4:4, 1974, pp. 5-20.

P.J. James, "A Critique of 'Ramses II and His Time'", *SISR* III : 2, 1978, pp. 48-55.

P.J. James, 'Abimilki, Azaru and Nikmed in the El-Amarna Correspondence and the Assyrian Annals', *KRONOS* IV:1, 1978, pp. 43-55.

P.J. James, "The Dating of the El-Amarna Letters", *SISR* II:3, 1977-78, pp. 80-85.

P.J. James, "Notes on the 'Assuruballit Problem'", *SISR* IV :1, 1979, pp. 18-22 (the first part of a series of articles dealing with Egyptian synchronisms with Assyria and Babylonia and the problems raised by Burgstahler in the article above), and other articles forthcoming.

V. Studies of Mesopotamia and Ebla

a) Mesopotamia

Relevant chapters in D.J. Wiseman (ed.) as in I. above, and relevant chapters in Moscati (1957 & 1960), also in I. above.

J. Loesse, *Peoples of Ancient Assyria*, Routledge & Kegan Paul, London, 1963. A history of Assyria, closely based on native inscriptions and letters.

A.T. Olmstead, *History of Assyria*, Scribners, London, 1923.

J. Oates, *Babylon*, Thames & Hudson, London, 1979.

b) Ebla

Kitchen, *The Bible in its World*, as in I. above.

E. Pettinato, "The Royal Archives of Tel Mardikh-Ebla", *BA* 39/2, 1976, pp. 44-52.

P. Matthiae, "Ebla in the Late Early Syrian Period: The Royal Palace and State Archives", *BA* 39/3, 1976, pp. 94-113.

D.N. Freedman, "The Real Story of the Ebla Tablets: Ebla and the Cities of the Plain", *BA* 41/4, 1978, pp. 143-164 (largely speculative and based on misreadings of certain names; see pp. 151-2 of the article by Archi listed below).

R. Biggs, "The Ebla Tablets: An Interim Perspective", *BA* 43/2, 1980, pp. 76-87.

G. Pettinato, "Ebla and the Bible", *BA* 43/4, 1980, pp. 203-216.

A. Archi, "Further Concerning Ebla and the Bible", *BA* 44/3, 1981, pp. 145-154.

P. Matthiae, *Ebla: An Empire Rediscovered*, Hodder, London, 1980.

ON THE BIG BANG THEORY OF CREATION

J.B. Griffiths

Cosmological theories are theoretical models constructed to represent the general properties of the universe considered as a whole. At present, the theory that is generally accepted is known as the “big bang theory”. In fact amongst astronomers and cosmologists this theory is now almost unanimously held. The purpose of this paper is to present an assessment of this theory, particularly from a theological point of view. A number of detailed expositions of the big bang theory are readily available.¹ However it is still necessary here to present a brief summary of its essential features before turning to assess it.

For the purpose of this paper it will be assumed that the universe is observed to be expanding, although the evidence for this is by no means conclusive. Some non-expanding cosmologies have been suggested², but these have not been as fully developed as the standard big bang model and have received very little attention.

Assuming that the universe is at present expanding, it can immediately be inferred that at previous times it was in a more dense state. And the further one considers extrapolating back into the past, the more dense the universe would appear. If the expansion were perfect, then on continuous extrapolation one would eventually arrive at a point of infinite density. This point could be described as a point of explosion or, in mathematical terms, a singularity. And the explosion could be considered to cause the subsequent expansion. In simple terms this is the concept that is involved in the big bang theory.

It used to be thought that allowing for an additional random motion, the universe could be extrapolated back to a state of maximum density, prior to which the universe would be contracting. However it has recently been shown using the general theory of relativity that a singularity, or point of infinite density, cannot be avoided. Thus a big bang producing an expanding universe seems almost inevitable.

However, underlying this whole approach to cosmology is the assumption that it is legitimate to extrapolate backwards in time for as long as physical laws remain comprehensible. Now, it is legitimate to extrapolate any physical system backwards in time for as long as the laws describing the system are known to be valid. But this process must be stopped when the laws are changed. This happens whenever external influences are introduced, particularly those that initiate the system being considered. Thus an unrestricted backwards extrapolation on the cosmological scale is only possible on the assumption that there is nothing external to the universe capable of altering it in any way. This amounts to an assumption of atheism, and it is only on the

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basis of such an assumption that the occurrence of a big bang can be inferred. The alternative, that should be acknowledged by any agnostic, is to allow for the possibility that God created the entire universe at some time in the past. Although it is mathematically possible to extrapolate physical laws prior to such an event, the analysis would be meaningless.

Ignoring the possible meaninglessness of such an activity, let us now consider extrapolating backwards towards the singularity. As we imagine going backwards in time, the universe would appear to become hotter and more dense. At a certain temperature and density, the matter and radiation would couple together, and the matter would ionise. Then as the temperature and density tended to become infinite, the individual atoms composing the matter would no longer be distinguishable. Under such conditions new physical theories have to be considered.

From the current estimate of the rate of expansion of the universe, it is calculated that the big bang occurred about 15,000,000,000 years ago. However for big bang cosmologists it is the first 1,000,000 years of this that is the most interesting, and particularly the first three minutes! It seems to be generally accepted that the physical processes occurring after the first millionth of a second are well understood. Some physicists are prepared to describe what happened after the first 10^{-23} sec, and some even after the first 10^{-43} sec at which time the temperature is assumed to be about 10^{31} K; others are a little more cautious! It is however generally thought that at such early times, the very strong gravitational field could actually initiate the creation of elementary particles—a process which is central to the modern big bang theory.

In order to describe the theory, it is appropriate now to start with the big bang and to proceed forwards in time.

It has now become common to regard the big bang as a purely gravitational singularity. It is considered that the universe started as an empty, highly chaotic, gravitational field. In such a field the very strong tidal gravitational forces could tear apart the vacuum, triggering the pair production of particles and their antiparticles. This is assumed to be the reverse of the more familiar process in which particles and their antiparticles mutually annihilate each other releasing energy. In this case it is the energy from the field that is used to trigger the creation of particle-antiparticle pairs. Protons, antiprotons, quarks, antiquarks and various mesons could be created, and this creation of matter would tend to even out the universe making it more uniform. The period in which these processes are considered to occur is referred to as the Hadron era, an era which lasts until the temperature drops to about 100,000,000,000 K, when the universe is about one hundredth of a second old!

The next period is known as the Lepton era. In it most of the particles and antiparticles that had been created would quickly annihilate each other leaving high energy radiation. This radiation in turn would trigger the pair production of electrons and positrons. Some of the electrons would combine with the remaining protons to produce neutrons and neutrinos. However as the universe expanded the radiation would cool, and once the temperature fell below 10,000,000,000 K these processes would suddenly stop. At this point, when the universe was about one second old, it is thought that there was one neutron for every six protons. From this point on, the number of elementary particles in the universe would remain approximately constant.

It is then thought that, about the end of the first minute, when the temperature had fallen to 1,000,000,000 K, the process of nucleosynthesis would start. This process begins with the combination of a proton and a neutron to make a nucleus of deuterium (heavy hydrogen). The nucleus of deuterium readily absorbs another neutron and finally another proton to form a nucleus of helium. All the available neutrons would be used up in this process, the remaining protons eventually appearing as hydrogen nuclei. At the end of this process therefore there would be one helium nucleus for every ten of hydrogen, a ratio which is in general agreement with observations.

In the standard big bang model, after the first few minutes the nuclear reactions would stop and the universe would continue to expand uneventfully for the next third of a million years, a period known as the radiation era. During this time matter and radiation would be coupled together in thermal equilibrium, and the universe would be dominated by radiation. The expansion would be associated with a continual decrease in temperature, and as the temperature dropped the energy density of matter would become more and more significant compared to that of the radiation. At the end of this era the matter and radiation would decouple, the electrons which previously had moved freely would become bound to the nuclei, and the universe would become transparent. After this the background radiation would continue to cool, but the matter would coalesce gravitationally to form stars and galaxies. Finally, the higher elements would be formed in the final death throes of stars which were originally formed from the hydrogen and helium that emerged from the primeval fireball.

The above summary of the big bang theory has been necessarily simplified. There are in addition a number of variations that have not been considered. However it should be sufficient to demonstrate the general character of the theory and some of its weaknesses. To this assessment we now turn.

To start with there are a number of theoretical objections to the theories for the initial creation of matter. There is as yet no entirely adequate way of

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combining gravitation with elementary particle theory. Ideally what is required is a unified theory of relativity and quantum mechanics and such has not yet been developed.

There are also grave philosophical objections to the very concept that the universe came into existence according to knowable or universal physical laws. Thus even if a theory could be developed that was mathematically consistent, it would not be acceptable to apply such a theory to the processes that are considered to occur in an initial period of creation.

In addition, the physical situation is such that no such theory could ever be independently tested. The conditions that are assumed to prevail for the first few minutes after the big bang involve gravitational fields, densities and temperatures that are so much greater than those we can experiment with that exotic new phenomena are assumed to occur. Since such a theory could not be tested even in principle, it should not strictly be claimed to be scientific.³ It is however possible to test the theory in one sense. Namely, that if its application indicated that the universe would be qualitatively different from what is observed, the theory should be rejected. But the testing of a theory only by its remote after-effects is not the same as testing the processes that the theory claims to describe. Numerous different supposed processes could possibly give rise to the same set of particular conditions. Thus, even if a set of theories was developed which predicted a universe with physical properties exactly as observed, it would say more about the ingenuity of its inventors than about the actual history of the universe.

No cosmological theory however is at present consistent with all observations. The big bang theory adequately describes the apparent expansion of the universe that is indicated by the approximate redshift/distance relation, the thermodynamic inequilibrium and the relative abundance of helium. It is also corroborated by the observation of the 3K microwave background radiation. But it is embarrassed by the present estimate of the rate of deceleration of the expansion, and by the failure to detect primordial quarks which according to the big bang theory should still exist. Both of these results however have such a degree of uncertainty associated with them, that they cannot yet be regarded as disproving the theory.

A more significant problem is the fact that in the standard big bang model it would appear to be impossible for galaxies to form. The considered rate of expansion of the universe is sufficient to stabilise a homogeneous distribution of matter against gravitational perturbations. Thus the primordial distribution of matter would not condense into gravitationally bound objects such as galaxies. This difficulty has stimulated considerable research in recent years and a number of possible solutions have been suggested, most of which involve a decreased estimate of homogeneity in the early universe.

A further problem is associated with the fact that we appear to live in a universe composed of matter with almost no antimatter. Yet in the creation of particles by pair production, each particle is created with its antiparticle. This difficulty is usually answered either by the dogmatic assertion that more matter must have been created than antimatter, or by the suggestion that equivalent amounts to antimatter must have accumulated elsewhere in the universe forming antigalaxies to correspond with our local galaxies.⁴

Turning now to the theological aspects of the theory, it should first be recognised that most popular expositions of cosmology are either blatantly atheistic or implicitly pantheistic. They exclude any reference to a personal God, and in the latter, nature with a capital N is accorded the attributes of deity.

It is instructive to consider the motivation leading the theories like that of the big bang. The starting point is the classic question—"Where did we come from?". With the assumption of atheism, the inevitable answer must be that we evolved from more simple animals. These animals in turn must have evolved, ultimately from the most simple forms of life, and life itself must have come from large molecules which must have evolved from smaller molecules. At this point the remaining question is—"But where did the atoms come from?". And the answer inevitably is that they must have evolved via astrophysical processes from the simplest atoms that were created in the big bang. These answers are regarded as complete. If creation is denied, they seem to be inevitable. We have an entirely mechanistic universe, and only the ultimate question remains, namely—"What triggered the big bang?". It should thus be seen that the theory of atomic evolution that is inherent in the big bang theory is merely the next step back from the theories of biological evolution and molecular evolution.

The big bang theory however is different in character from the other theories of evolution. The theory of biological evolution is a theory of origins. It claims to describe the origin of species. The theory of molecular evolution is also a theory of origins. It claims to describe the origin of life. But the big bang theory claims to describe more than the origin of atoms and galaxies. It is essentially a theory of creation. In a completely naturalistic way it claims to describe the processes which started with nothing and end with the universe as we observe it today. The big bang theory thus claims to explain the creation of the universe in terms of purely physical processes which require no assistance from a Creator.

In the same way as the Copernican revolution had profound effects throughout society in the sixteenth and seventeenth centuries⁵, the big bang theory is also likely to make a profound contribution to the thinking of modern

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society. It provides the basic framework for an atheistic system, thus finalising the Darwinian revolution. It describes a creation without a Creator and hence also strengthens the belief in an end of the world without a judgment.

It should on the other hand, also be recognised that, for many people, postulating the existence of an orderly universe seems to be almost the same thing as postulating a Creator. This is after all just the teleological argument for the existence of God that has been considered in natural theology for centuries. It was theological overtones such as these that kept the subject of cosmology unrespectable scientifically until the work of Einstein. And Einstein himself, as a consistent agnostic, felt compelled to clarify his position of acknowledging the comprehensibility of the world as a miracle without implying anything from it. "Curiously", he once wrote to a friend, "we have to be resigned to recognizing the 'miracle' without having any legitimate way of getting any further. I have to add the last point explicitly, lest you think that, weakened by age, I have fallen prey to priests."⁶

With the development of the big bang theory however, the theological overtones of cosmology have been removed. The cosmological and teleological arguments for the existence of God have been undermined, so that atheists now have no hesitation in describing the properties of an objective universe. For them the big bang theory justifies their approach, and they are therefore motivated to retain the framework of the theory in spite of any observational evidence against it.

Not all cosmologists however are atheists. There is a common theistic approach to cosmology which simply regards God as the initiator of the big bang. This is regarded as being consistent with a naturalistic universe in which God also provides the purpose underlying the evolutionary process. Advocates of this view may, or may not, accept the validity of the cosmological argument for the existence of God, but their idea of God is more likely to be that of Socrates or Spinoza than of the bible.

In order to develop a more biblical approach to cosmology, it has sometimes been suggested that God created the world as we observe it in a period of six days, using material previously created in a big bang. Thus on the fourth day it is suggested that the sun, moon and stars were created in the sense that the sky was cleared so that they became visible, having previously existed. It is not possible here to discuss whether or not this interpretation is compatible with the biblical text. However it must be pointed out that to reject biological and molecular evolution in favour of fiat creation, and then to accept the atomic evolutionary theory of the big bang, is surely inconsistent.

The main emphasis of the Genesis account is that there was a period of

creation, prior to which nothing existed, and after which the world existed more or less in the form in which it is observed today. Evangelicals have little regard for philosophical proofs for the existence of God such as the teleological argument, but are prepared to use the argument the other way round. Because God exists and has created the universe, it should be expected that the universe would be orderly and hence amenable to scientific enquiry. Thus in the period since the creation, physical laws may be considered to be usually satisfied, and cosmological theories may be considered.

Many Christians who believe in a recent six day creation have found difficulties with the subject of cosmology. It sounds inconsistent to estimate the diameter of our galaxy as sixty thousand light years if the universe was created only ten thousand years ago. And since cosmological theories mainly consider effects on the scale of hundreds of millions of light years, considerable problems are inevitable.

There is obviously great scope for new cosmologies to be developed that are consistent with the assumption of divine creation. There is a great need for more work to be done in this field. However the task should be undertaken with humility and wonder, for who are we to comprehend the handiwork of almighty God.

FOOTNOTES

1. Among the best popular expositions are:—
S. Weinberg, *The First Three Minutes* (Basic Books, 1977)
J. Silk, *The Big Bang* (Freeman, 1980)
2. For two alternative cosmologies see—
I.E. Segal, *Mathematical Cosmology and Extragalactic Astronomy* (Academic Press, 1976)
J.-P. Vigiér, *Cosmological implications of non-velocity redshifts—a tired light mechanism*, in *Cosmology, History and Theology*, edited by W. Yourgrau and A.D. Breck (Plenum Press, 1977), chapter 11.
3. For an analysis of the big bang theory as a myth see—
H. Alfven, *Cosmology: Myth or Science?* in *Cosmology, History and Theology*, chapter 1.
4. See—H. Alfven, *Worlds-Antiworlds* (Freeman, 1966)
5. See—T.S. Kuhn, *The Copernican Revolution* (Harvard, 1957).
6. A. Einstein, *Lettres a Maurice Solovine* (Gauthier-Villars, Paris, 1956)
p. 114

HUMAN LIFE SUPPORT FACTORS IN GENESIS ONE

by Gerald Duffett

Various physico-chemical factors contribute to human life. Table 1 shows them arranged in order. Alongside each factor is the approximate time of survival in the event of it being discontinued.

TABLE 1

Life support factor	Period of survival once a factor is withdrawn		
	Time =	no. of seconds =	common logarithm
Energy	0 secs.	0	0.000
Oxygen ¹	12 mins.	720	2.86
Water ²	2 days	172800	5.24
Food ³	54 days	4665600	6.67

The above results indicate an order of priority for each factor according to the parameter of survival period. The sequence is first energy, secondly oxygen, thirdly water and lastly food. Even doubling the survival period of one factor and halving that of any other cannot alter their order of priority.

Another set of parameters exists for human life-support factors. It is their order of special creation and/or separation, leading up to the climax—the formation of mankind. To that end each stage of creation was implemented and evaluated.

Now the parameter of creational succession may be calculated provided that we assume that the evaluation of each life-support factor took as much time as its creation. Table 2 gives details about their order of creation.

TABLE 2

Life-support factor	Order of special creation		Time parameter
	Day	Notes	
Energy	1	Light is a form of of radiant energy	0.5 (=mid-Day 1)
Oxygen	2	Firmament between sea level and clouds is tropo- sphere where air is is richest in oxygen	1.5 (=mid-Day 2)
Water	3	Sorted out before plant life appeared	2.25 (=mid-1st½Day 3)
Food	3	Plants: according to verse 29 they were 'yours for food'	2.75 (=mid-2nd½Day 3)

The values in the fourth column of both tables 1 & 2 help to plot the position of each life-support factor in Figure 1. The x-axis parameter is the logarithm of the survival period and the y-axis is creational succession. In short it is the plot of urgency against priority. Only by deliberate planning will perfect correlation result.

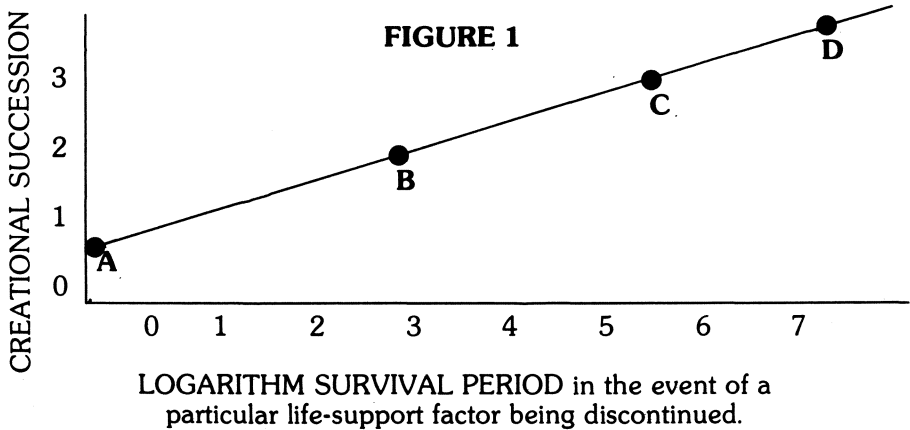


Fig. 1 shows that there is perfect correlation between the parameters of human life-support factors included in this brief study. But two other relationships seem to find confirmation. One is teleological—the order of necessity is the same as the sequence of its alleviation. The other is that the planet earth was made for its Creator's image—man.

References

1. Illustrated Medical Encyclopedia, p.105 (see article on Asphyxia). Stuttman, New York, 1980.
2. Illustrated Family Medical Encyclopaedia, p.90 (see article on Dehydration). Reader's Digest, London, 1975.
3. British press reports about prisoners in Northern Ireland on hunger strike.

BIOLOGY BOOK LIST

Sylvia Baker

- A GENERAL** Aimed at a wide readership, publications 1-4 cover many aspects of the creation/evolution debate, as they relate to biology.

1. **WHAT ABOUT ORIGINS?** by A.J. Monty White
Dunestone Printers Ltd 1978
2. **BONE OF CONTENTION** by Sylvia Baker Evangelical Press 1976
3. **IN THE BEGINNING** by Roger D.G. Price
Dunestone Printers Ltd 1979
4. **CREATION - THE FACTS OF LIFE** by Gary E. Parker
CLP Publishers 1980

This covers an especially wide range of biological issues, although at a fairly elementary level. Those undeterred by the racy American style will find it helpful.

- *5 **IMPLICATIONS OF EVOLUTION** by G. A. Kerkut
Pergamon Press 1960

Examines the basic assumptions behind evolutionary theory and shows that many of them are without any supporting evidence. The author says, "I shall present evidence for the point of view that there are many discrete groups of animals and that we do not know how they have evolved, nor how they are interrelated." More technical than 1-4.

6. **EVOLUTION AND THE CHRISTIAN FAITH** by Bolton Davidheiser
Presbyterian & Reformed Publishing Company 1969

The author has a Ph D in Zoology with a speciality in Genetics. The book deals with many supposed biological evidences for evolution as well as covering the history of evolutionary thought.

7. **EVOLUTION: POSSIBLE OR IMPOSSIBLE?** by James F. Coppedge
Zondervan Publishing House 1973

Dealing with molecular biology and the laws of chance, this book seeks to show how vanishingly small is the probability that gene or protein structure could have been generated by random processes.

8. **THE CREATION OF LIFE** by A.E. Wilder-Smith
Harold Shaw Publishers 1970

Taking a cybernetic approach to evolution, this deals both with biochemical evolution and the problems presented to evolutionary theory by such things as consciousness, intelligence and brain function.

B PALAEONTOLOGY

9. EVOLUTION: THE FOSSILS SAY NO by Duane T. Gish
Creation-Life Publishers 1973
10. FOSSILS IN FOCUS by J.K. Anderson and H.G. Coffin
Zondervan Publishing House 1977
These are two general studies of the fossil record presenting the creationist viewpoint.
11. APE-MEN FACT OR FALLACY by M. Bowden
Sovereign Publications 1977
An extensive and thought-provoking survey of the supposed ape-man fossils, although the more recent East African finds are only superficially dealt with.
12. THE ALLEGED EVOLUTION OF THE HORSE by Frank W. Cousins
in A Symposium on Creation 3 p.69 Baker Book House 1971
For a further discussion of the supposed evolution of the horse, see "Implications of Evolution" (No. 5 above).
13. A STUDY OF ENGLISH MICRASTER RESEARCH FROM A CREATIONISTS POINT OF VIEW by Rita Rhodes Ward in Scientific Studies in Special Creation Ed. W. Lammerts
Presbyterian Reformed Pub. Co. 1971
14. THE ALLEGED EVOLUTION OF BIRDS (ARCHEOPTERYX) by Frank W. Cousins
in Symposium on Creation 3 p.89 Baker Book House 1971
15. ANOTHER LOOK AT ARCHEOPTERYX by C. Brown
Creation Research Society Quarterly 17 page 87 (Sept. 1980)
16. TRACKING THOSE INCREDIBLE DINOSAURS by John Morris
CLP PUBLISHERS 1980
One fossil find of great relevance to the creation/evolution debate is that of dinosaur footprints and human footprints found together at Glen Rose, Texas. The purpose of this 240-page book is to provide all the information that is pertinent to that find.

C GENETICS

17. AFTER ITS KIND by Bryon C. Nelson
Bethany Fellowship Revised Edition 1967
First published in 1927, this book contains many challenges to Darwinism that have never been answered.

18. DARWIN RETRIED by Norman Macbeth *
Garnstone Press 1974
Written by a lawyer, this work exposes many logical flaws in Darwin's theory of natural selection. He claims that classical Darwinism has slowly been abandoned and that there are serious difficulties even with neo-Darwinism.
19. MATHEMATICAL CHALLENGES TO THE NEO-DARWINIAN INTERPRETATION OF EVOLUTION edited by P.S. Moorhead and M.P. Kaplan *
The Wistar Institute Press Philadelphia 1967
A symposium in which evolutionist mathematicians agreed that mutation and natural selection do not offer an adequate mechanism for evolutionary change.
20. EVOLUTION OF LIVING ORGANISMS by Pierre Grasse *
Academic Press 1977
A very detailed work from well-qualified evolutionist who has rejected Darwinism, giving his reasons for doing so.
21. AN ANALYSIS OF DARWIN'S NATURAL SELECTION by Randall R. Hedeke
Creation Research Society Quarterly 16 page 89 (Sept. 1979)
22. NATURAL SELECTION RE-EXAMINED by G.F. Howe and P. W. Davis
Creation Research Society Quarterly 8 page 31 (June 1971)
23. SEVENTEEN PROBLEMS FOR EVOLUTIONISTS by A.F. Poetter
Creation Research Society Quarterly 14 page 113 (Sept. 1977)
Many of these problems are in areas related to genetics.
24. GENETICS AND CREATION STUDIES by William J. Ouweneel
Creation Research Society Quarterly 14 page 27 (June 1977)

* indicates works by those holding an evolutionist viewpoint.

BOOK REVIEW

The Creation - Evolution Controversy — R.L. Wysong

Michigan : Inquiry Press, 1976 455 pp. approx £5.00

“The creation-evolution controversy has been raging for nearly a century . . . The importance of the subject, however, does not change with time or circumstances . . . The resolution of this controversy is vital to the formulation of a life-philosophy and, consequently, affects life itself. But, interestingly, there is probably no subject of greater interest or import that wallows in so much public ignorance.” This comment from the Foreword of Wysong’s book gives some indication of his aim. The author then describes his attempt to present the arguments of both creationists and evolutionists in a clear and concise manner. He employs the 2—model approach to the presentation of origins which encourages, and allows, readers to examine the evidence and draw their own conclusions.

The scope of the book is comprehensive. Starting with basic philosophical principles underlying different approaches to origins, Wysong goes on to discuss the implications of the controversy, methodology, biological sciences, genetics, chemical evolution, organic evolution and the earth sciences. “The book is designed for the serious student of origins, the searcher, the prober looking for an in-depth treatment, the investigator wanting to understand and make the material his own and not just be dogmatically told; the book is not meant for a simple light reading.” (p.vi)

In the reviewer’s judgement, this study is a valuable addition to the literature, and it deserves a wide readership. The style of the book makes it suitable for at least three types of reader. It will be of help to creationists, in that it presents arguments in a clear and logical manner, distinguishing between what is relevant and what is not relevant to the point at issue. Secondly, the book is ideal for educational use: as a reference text, it is unsurpassed. Thirdly, this is a book which can be given to committed evolutionists, to stir them to reconsider their position. One of the limitations of creationist literature is that much of it is designed for the general reader. Consequently, people who have some expertise in a subject tend to find the discussion of evidence with which they are familiar to be lacking in depth and comprehensiveness. Being unpersuaded by some particular arguments, they conclude that the whole position is untenable. Since Wysong’s study is at a deeper level, and since it encourages critical analysis of the data by the reader, it is more likely to be read with respect by evolutionists.

The book is printed from typescript using photolithography. For those who are accustomed to reading literature of this kind, there is no problem. However, the format may detract from its usefulness with some readers. On the positive side, the arguments are well documented and there is a good bibliography. Furthermore, the book is generously supplied with helpful illustrations and diagrams. Not only do they add interest to the text, they also demonstrate to writers and speakers who may read the book how simple visual aids can be effectively employed in the presentation of an argument.

David J. Tyler

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